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☐ 1: Biosens Bioelectron. 2003 Sep;18(10):1209-18.

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[Full-Text Article](#)**Lung cancer identification by the analysis of breath by means of an array of non-selective gas sensors.****Di Natale C, Macagnano A, Martinelli E, Paolesse R, D'Arcangelo G, Roscioni C, Finazzi-Agro A, D'Amico A.**Department of Electronic Engineering, University of Rome Tor Vergata, via di Tor Vergata 110, 00133 Rome, Italy. dinatale@ehn.uniroma2.it

Previous finding shown that the composition of the breath of patients with lung cancer contains information that could be used to detect the disease. These volatiles are mainly alkanes and aromatic compounds. Sensor arrays technology (electronic nose) proved to be useful to screen samples characterised by different headspace composition. Here we investigated the possibility of using an electronic nose to check whether volatile compounds present in expired air may diagnose lung cancer. Breath samples were collected and immediately analysed by an electronic nose. A total of 60 individuals were involved in the experiment. 35 of them were affected by lung cancer, 18 individuals were measured as reference and nine were measured after the surgical therapy. Two individuals were measured twice, before and after the surgical therapy, for a total of 62 measurements. An electronic nose, composed by eight quartz microbalance (QMB) gas sensors, coated with different metalloporphyrins, was used. These sensors show a good sensitivity towards those compounds previously indicated as possible lung cancer markers in breath. The application of a 'partial least squares-discriminant analysis' (PLS-DA) found out a 100% of classification of lung cancer affected patients, 94% of reference was correctly classified. The class of post-surgery patients were correctly individuated in 44% of the cases, while the other samples were classified as healthy references. The alteration of breath composition induced by the presence of lung cancer was enough to allow a complete identification of the sample of diseased individuals. Extended studies are necessary to evaluate the resolution of the method, namely the stage at which the disease may be identified in order to use this instrument for early diagnosis.

PMID: 12835038 [PubMed - indexed for MEDLINE]

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